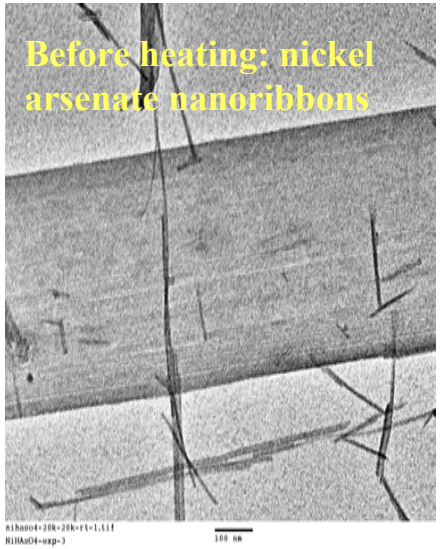
Synthetic Challenges in the Preparation of Transition Metal Phosphides and Arsenides on the Nanoscale

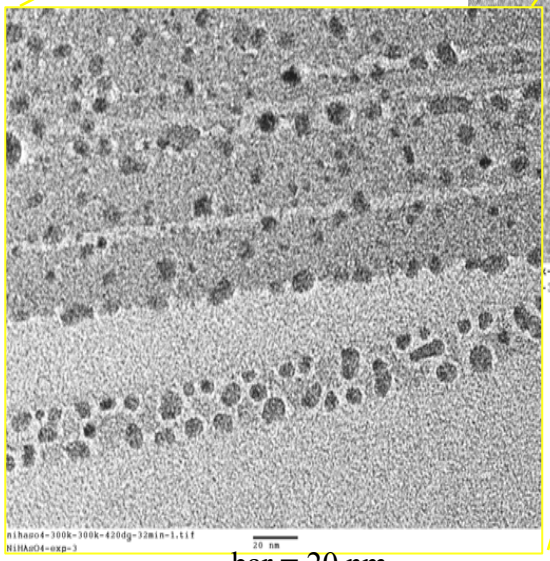
Stephanie L. Brock, Wayne State University, DMR-0094213

Using NSF funds, a new technique for patterning of nanoparticles by using sacrificial templates has been developed. Nickel arsenate nanoribbons (left) are converted into nickel arsenide nanoparticles (right), upon heating on a thin layer of carbon. The particles form exclusively in the region defined by the template.

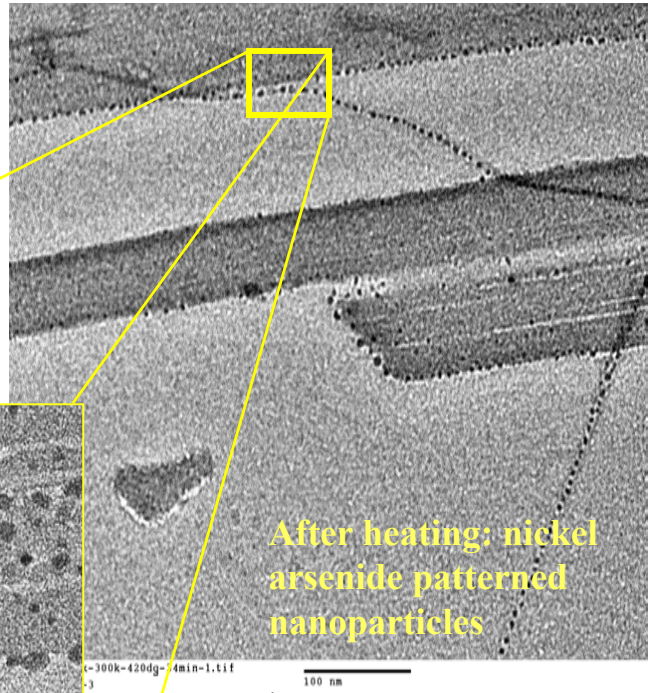


bar = 100 nm

420 ˚C 34 min



bar = 20 nm



bar = 100 nm

The ability to control the location of nanoparticles is an important criterion for their use in devices.

Synthetic Challenges in the Preparation of Transition Metal Phosphides and Arsenides on the Nanoscale

Stephanie L. Brock, Wayne State University, DMR-0094213

Training Future Scientists: The advent of nanotechnology requires scientists who are able to work in multidisciplinary teams and who are trained in a wide variety of characterization techniques. As part of their NSF-sponsored research, graduate students (five), undergraduate students (one) and postdocs (one) in the Brock Group are collaborating with colleagues in Physics, Engineering and Pharmaceutical Sciences. In the process, students are acquiring hands-on experience with state of the art instrumentation, including electron and atomic force microscopes. This past year, we have also acted as a host institution for an undergraduate student participating in the NSF Summer Research Program in Solid State Chemistry.

Michele Tague, an undergraduate from Keene State College, NH, and participant in the NSF Summer Research Program in Solid State Chemistry, seals a sample in a glass ampoule.